

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Exam: Function Reflections (EXAM version 626)**

1. (worth 9 points) Let function  $f$  be defined by the polynomial below:

$$f(x) = -4x^5 - 9x^4 + 5x^3 + 8x^2 - 7x - 3$$

Draw lines that match each function reflection with its polynomial:

**Reflections**

$f(-x)$  •

$-f(x)$  •

$-f(-x)$  •

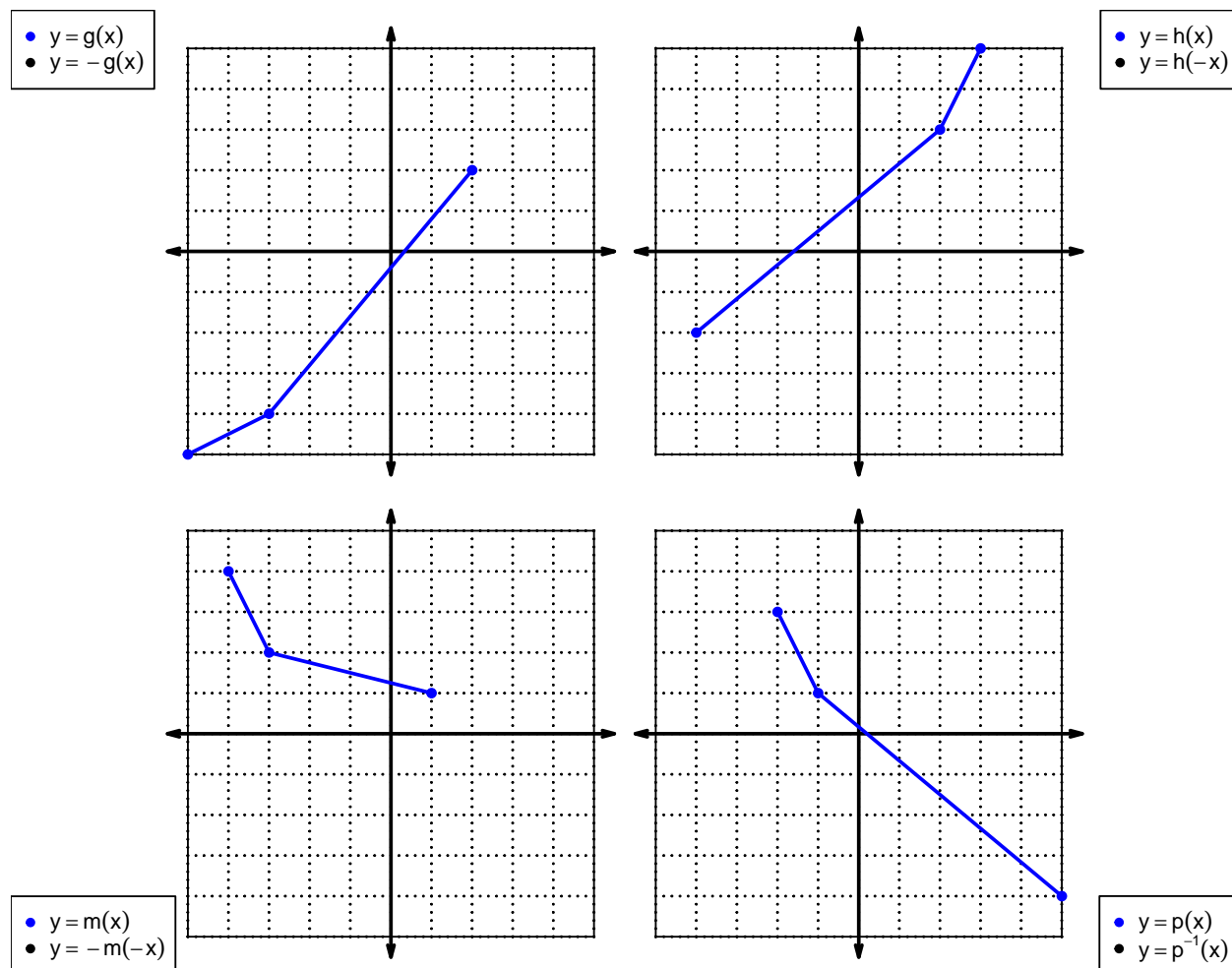
**Polynomials**

•  $4x^5 + 9x^4 - 5x^3 - 8x^2 + 7x + 3$

•  $4x^5 - 9x^4 - 5x^3 + 8x^2 + 7x - 3$

•  $-4x^5 + 9x^4 + 5x^3 - 8x^2 - 7x + 3$

2. (worth 20 points) In each  $xy$  plane shown below, a function is graphed with blue. Draw the indicated reflections (as a second curve, indicated in legend) with black (or with whatever you have). The  $x$  axis is horizontal and the  $y$  axis is vertical (as typical), and the scale is equal on both axes.



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For all questions on this page, the functions  $f$ ,  $g$ , and  $h$  are defined by the table below.

$x$	$f(x)$	$g(x)$	$h(x)$
1	2	7	5
2	5	9	7
3	9	5	1
4	7	6	4
5	8	1	6
6	1	2	8
7	6	3	9
8	3	4	2
9	4	8	3

3. (worth 3 points) Evaluate  $h(7)$ .

4. (worth 3 points) Evaluate  $g^{-1}(1)$ .

5. (worth 3 points) Assuming  $h$  is an **even** function, evaluate  $h(-6)$ .

6. (worth 3 points) Assuming  $f$  is an **odd** function, evaluate  $f(-4)$ .

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7. (worth 15 points) A function,  $f$ , is **even** if  $f(x) = f(-x)$  for all  $x$  in the domain. A function,  $g$ , is **odd** if  $g(x) = -g(-x)$  for all  $x$  in the domain.

Let polynomial  $p$  be defined with the following equation:

$$p(x) = x^3 - 1$$

- a. Express  $p(-x)$  as a polynomial in standard form.

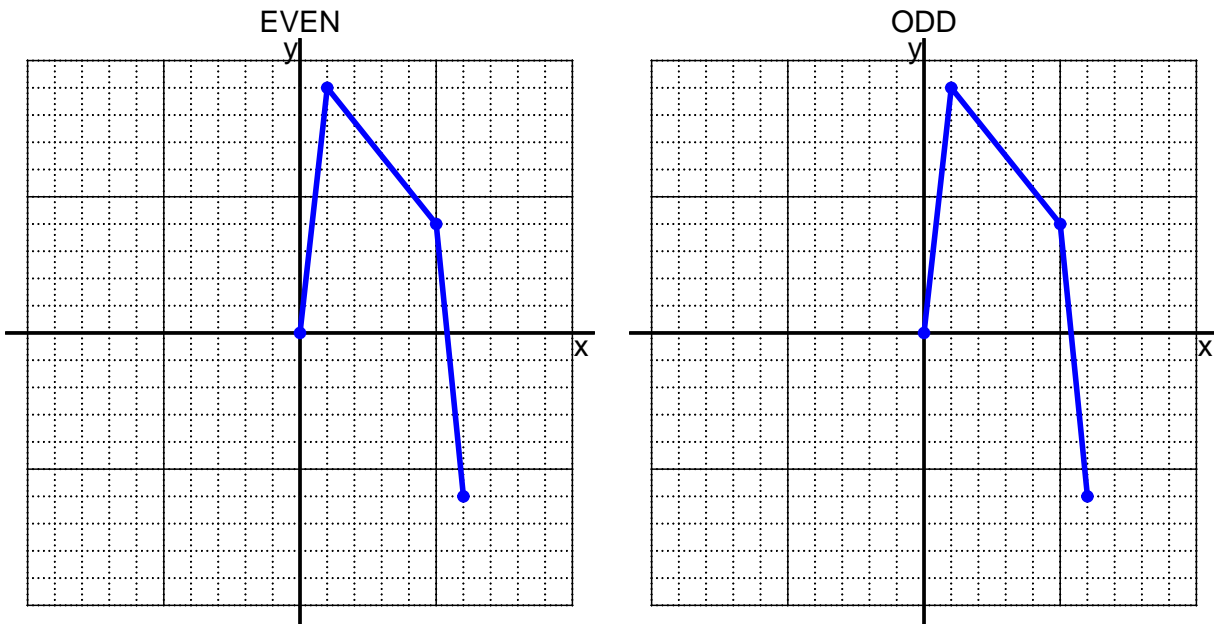
- b. Express  $-p(-x)$  as a polynomial in standard form.

- c. Is polynomial  $p$  even, odd, or neither?

- d. Explain how you know the answer to part c.

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8. (worth 10 points) I have drawn half of a function. Draw the other half to make it even or odd.



9. (worth 10 points) Let function  $f$  be defined with the equation below.

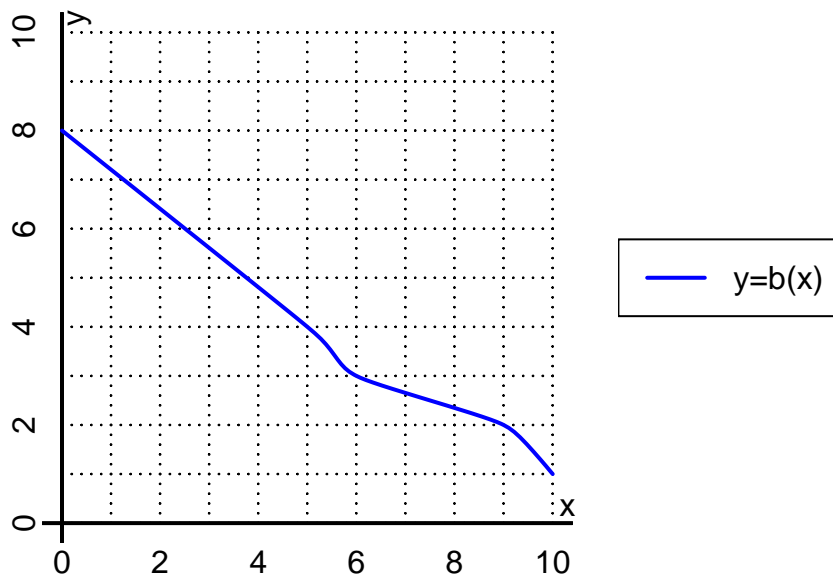
$$f(x) = 3(x + 7)$$

a. Evaluate  $f(22)$ .

b. Evaluate  $f^{-1}(66)$ .

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10. (worth 6 points) The function  $b$  is represented by the curve  $y = b(x)$  graphed below.



a. Evaluate  $b(5)$ .

b. Evaluate  $b^{-1}(2)$ .

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11. (worth 18 points) Function  $f$  is defined by the table below.

a. Complete the columns for  $-f(x)$  and  $f(-x)$  and  $-f(-x)$ .

$x$	$f(x)$	$-f(x)$	$f(-x)$	$-f(-x)$
-2	-9			
-1	7			
0	0			
1	7			
2	-9			

b. Is function  $f$  even, odd, or neither?

c. How do you know the answer to part b?